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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,626	06/20/2001	Hans Bruggemann	10537/126	4532

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EXAMINER

NGUYEN, TU MINH

ART UNIT

PAPER NUMBER

3748

9

DATE MAILED: 06/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/885,626

Applicant(s)  
Bruggemann et al.

Examiner  
Tu M. Nguyen

Art Unit  
3748



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jun 3, 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Jun 20, 2001 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                              | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ | 6) <input type="checkbox"/> Other:  |

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### DETAILED ACTION

1. An Applicant's Amendment filed on June 3, 2002 has been entered.

Claims 1 and 9 have been amended. Overall, claims 1-13 are pending in the application.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
- (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

3. Claims 1 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Peter-Hoblyn et al. (U.S. Patent 6,003,303).

As shown in Figure 1, Peter-Hoblyn et al. disclose an emission control system and a method for operating such system. The system comprises:

- a particle filter (30); and

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- an arrangement disposed upstream from the particle filter, the arrangement being configured to prevent development of ash-forming compounds of sulfur contained in an exhaust gas by maintaining at least a portion of the ash-forming compounds in a gaseous state flowable through the particle filter (a platinum group catalyst metal composition and an auxiliary catalyst metal composition are introduced into the fuel, exhaust gas, or combustion air, which are all located upstream of the particle filter, in order to lower the balance point of the particle filter (lines 30-55 of column 8). Thus, particulate matters can be combusted at the filter with minimal requirement of oxygen in the exhaust gas. Because of the low oxygen content in the exhaust gas, the generation of additional particulate matters from the oxidation of  $\text{SO}_2$  (gaseous state) to  $\text{SO}_3$  (solid state) is also reduced (lines 23-35 of column 27 and lines 17-19 of column 2)).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al. (U.S. Patent Application Publication 2001/0035006) in view of Araki et al. (U.S. Patent 5,850,735).

Re claims 1, 9, 12, and 13, as shown in Figure 17, Dou et al. disclose an emission control system, a method for operating such system, and a method and a device for reducing ash components in a particle filter of an exhaust system for a diesel engine. The device comprises a catalyst (3) disposed upstream from the particle filter (6),

wherein the catalyst (3) including a sulfur-storing catalyst configured as a NO<sub>x</sub> collector (paragraphs 0039 and 0044 on page 3), and

wherein the catalyst (3) being further configured to adsorb sulfur species in a fuel lean and low temperature environment; and to desorb the sulfur species in a fuel rich and high temperature environment.

Dou et al., however, fail to disclose the mechanism of sulfur adsorption and desorption in the catalyst (3), and how to minimize the production of sulfur particulate matters which can clog up the filter.

Araki et al. teach a method for purifying exhaust gas, that clearly describes in detail the mechanism of absorption and desorption of sulfur species in a SO<sub>x</sub> absorbent (5) (lines 5-57 of column 7). In a lean environment, sulfur compounds are absorbed by an absorbent layer of the SO<sub>x</sub> absorbent in the form of a SO<sub>4</sub> sulfate. In a fuel rich and high temperature environment, SO<sub>4</sub> is desorbed from the absorbent layer to become either SO<sub>2</sub> (gaseous state) or SO<sub>3</sub> (solid state).

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During the desorption of sulfur, Araki et al. selectively raise the exhaust gas to a temperature above a predetermined value and lower the oxygen content in the exhaust gas to minimize the conversion of  $\text{SO}_4$  to  $\text{SO}_3$  which is in a solid state (see Figures 2 and 3). In this way, more sulfur compounds ( $\text{SO}_2$ ) in the gaseous state are transformed from  $\text{SO}_4$ ; and an amount of particulate matters (in the form of  $\text{SO}_3$ ) released into the atmosphere can be maintained at a low level. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the method taught by Araki et al. in the system, methods, and device of Dou et al., since the use thereof would have minimized the generation of sulfur particulate matters which can clog up the particle filter.

Re claim 2, in the modified emission control system of Dou et al., the emission control system is configured for use with an internal combustion engine.

Re claim 3, in the modified emission control system of Dou et al., the system includes a  $\text{SO}_x$  collector (3).

Re claims 4 and 5, in the modified emission control system of Dou et al., the system includes a  $\text{NO}_x$  collector (3).

Re claims 6-8, in the modified emission control system of Dou et al., the system includes an oxidation catalyst (3) (paragraph 0044).

Re claim 10, the modified method of Dou et al. further comprises the steps of:

- operating the emission control system in a normal operating phase with a lean exhaust composition to store sulfur contained in the exhaust gas; and

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- operating the emission control system in a regeneration phase with a rich exhaust composition to release stored sulfur as at least one gaseous compound.

Re claim 11, in the modified method of Dou et al., the step of operating the emission control system in the regeneration phase includes the substep of raising an exhaust temperature to between 550°C and 700°C (Figures 4 and 5; paragraph 0050).

### *Response to Arguments*

6. Applicant's arguments with respect to the references applied in the previous Office Action have been fully considered but they are not persuasive.

In response to applicant's argument that Peter-Hoblyn et al. fail to disclose or suggest an arrangement configured to prevent development of ash-forming compounds of sulfur contained in an exhaust gas by maintaining at least a portion of the ash-forming compounds in a gaseous state flowable through the particle filter (page 4 of Applicant's Amendment), the examiner respectfully disagrees. As clearly indicated on lines 30-55 of column 8, Peter-Hoblyn et al. introduce a platinum group catalyst metal composition and an auxiliary catalyst metal composition into the fuel, exhaust gas, or combustion air in order to lower the balance point of the particle filter. Thus, particulate matters can be combusted at the filter with minimal requirement of oxygen in the exhaust gas. In addition, because of the low oxygen content in the exhaust gas, the generation of additional particulate matters from the oxidation of SO<sub>2</sub> (gaseous state) into SO<sub>3</sub> (solid state) is also reduced (also see lines 23-35 of column 27 and lines 13-19 of column 2). Thus, Peter-

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Hoblyn et al. clearly disclose an arrangement to prevent development of ash-forming compounds of sulfur ( $\text{SO}_3$ ) contained in an exhaust gas by maintaining at least a portion of the ash-forming compounds ( $\text{SO}_2$ ) in a gaseous state flowable through the particle filter.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, applicant argues that Araki et al. do not even teach how to prevent the development of ash-forming compounds that can enter the particle filter of Dou et al. (page 7 of Applicant's Amendment). The examiner again respectfully disagrees with this argument. As indicated on lines 5-57 of column 7, Araki et al. teach that during a fuel rich and high temperature environment to regenerate a  $\text{SO}_x$  absorbent (5),  $\text{SO}_4$  is desorbed from an absorbent layer of the  $\text{SO}_x$  absorbent to become either  $\text{SO}_2$  (gaseous state) or  $\text{SO}_3$  (solid state). To minimize the conversion of  $\text{SO}_4$  to the solid state  $\text{SO}_3$ , they selectively raise the exhaust gas to a temperature above a predetermined value and lower the oxygen content in the exhaust gas (also see Figures 2 and 3). In this way, more sulfur compounds ( $\text{SO}_2$ ) in the gaseous state are converted from  $\text{SO}_4$ , and thus, a lower amount of particulate matters (in the form of  $\text{SO}_3$ ) is released into the atmosphere. Therefore,

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Araki et al. clearly teach a method to prevent the development of ash-forming compounds that can enter the particle filter of Dou et al.

*Conclusion*

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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*Communication*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (703) 308-2833.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (703) 308-2623. The fax phone number for this group is (703) 308-7763.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1148.

*Tu M. Nguyen*

TMN

Tu M. Nguyen

June 14, 2002

Patent Examiner

Art Unit 3748

*Thomas Denion*

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